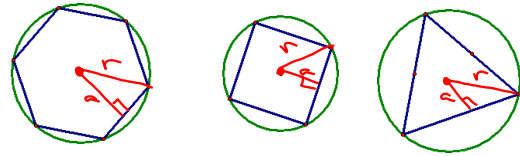


11-6 Areas of Regular Polygons

Any regular polygon can be inscribed in a circle.

Radius--from center to vertex

Apothem--from the center and perpendicular to one side



$$A = \frac{1}{2} a \cdot p$$

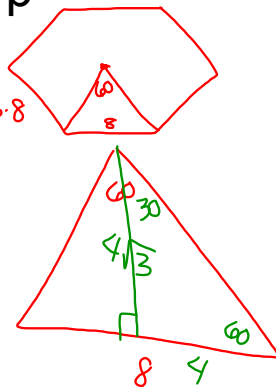
$$\text{Area} = \frac{1}{2} a p$$

example 1:
regular hexagon
side = 8 cm

$$A = \frac{1}{2} 4\sqrt{3} \cdot 48$$

$$96\sqrt{3} \text{ cm}^2$$

$$p = 6 \cdot 8$$



$$\text{Area} = \frac{1}{2} a p$$

example 2:
regular octagon
side = 5 cm

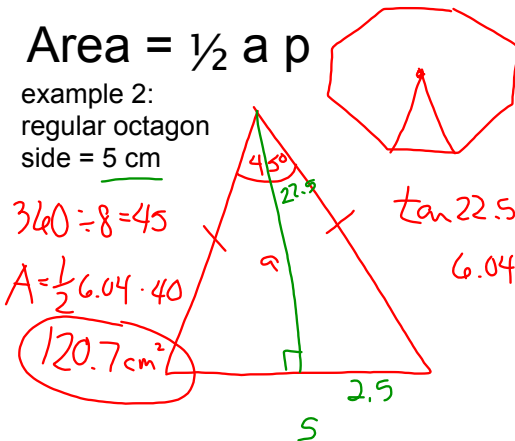
$$360 \div 8 = 45$$

$$A = \frac{1}{2} 6.04 \cdot 40$$

$$120.7 \text{ cm}^2$$

$$\tan 22.5 = \frac{2.5}{a}$$

$$6.04 \approx a$$



$$\text{Area} = \frac{1}{2} a p$$

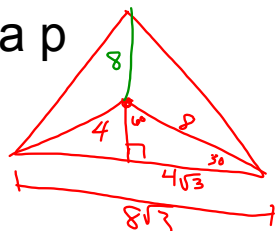
example 3:
regular triangle
apothem = 4 cm

$$A = \frac{1}{2} 4 \cdot 24\sqrt{3}$$

$$= 48\sqrt{3} \text{ cm}^2$$

$$A = \frac{1}{2} b h$$

$$\frac{1}{2} 8\sqrt{3} \cdot 12 = 48\sqrt{3} \text{ cm}^2$$



$$A = \frac{s^2 \sqrt{3}}{4}$$

$$\frac{(8\sqrt{3})^2 \sqrt{3}}{4} = 48\sqrt{3}$$

$$\text{Area} = \frac{1}{2} a p$$

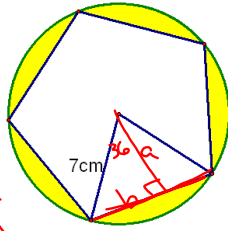
example 4:
regular pentagon
perimeter = 90 cm

$$a \approx 12.4$$

$$A \approx 557.4 \text{ cm}^2$$

Example 5:

Find the area of the shaded region.



Circle - Pentagon
 $49\pi - \frac{1}{2}(5.66)(41.1)$
 37.1 cm^2

$\cos 36 = \frac{a}{7}$
 $5.66 \approx a$
 $\sin 36 = \frac{b}{7}$
 $4.11 \approx b$
 $\times 2$
 $\times 5$

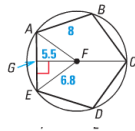
HW

p765-766

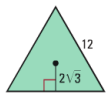
#s 1-4, 14-16, 27-29

VOCABULARY In Exercises 1–4, use the diagram shown.

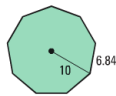
1. Identify the *center* of regular polygon $ABCDE$.
2. Identify a *central angle* of the polygon.
3. What is the *radius* of the polygon?
4. What is the *apothem*?

**FINDING AREA** Find the area of the regular polygon.

14.



15.



16.



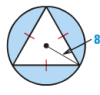
at classzone.com

POLYGONS IN CIRCLES Find the area of the shaded region.

27.



28.



29.

